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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/540,162

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EXAMINER

BAND, MICHAEL A

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/540,162	Applicant(s) SCHUETZE ET AL.	
	Examiner MICHAEL BAND	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31, 33 and 34 is/are pending in the application.
- 4a) Of the above claim(s) 17-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16, 33 and 34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the parallel and perpendicular magnetic fields on the target and the rim of said target must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

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2. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because the Drawings need to be in ENGLISH. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-7, 15, and 33-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Larrinaga (USPGPub 2004/0112736), equivalent to Goikoetxea et al (WO 02/077318).

With respect to claims 1-3, 15, and 33-34, Larrinaga discloses an arc evaporator comprising a target (i.e. cathode) [2] and a substrate [10] to be coated in a vacuum chamber (abstract), where fig. 1 depicts said target [2] in an effective area of a device comprising two magnet systems [3]-[5] with opposite poles. Larrinaga further discloses that the perpendicular component of the magnetic field generated by the two magnet

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systems [3]-[5] is zero over the whole surface of the target [2] (p. 2, para 0026). Fig. 1 further depicts the target [2] having a greater part that is at least 60% from the middle of said target [2] to a rim (i.e. end) of said target [2].

With respect to claims 4-5, Larrinaga further discloses in figs. 3-5 the perpendicular magnetic field changing from the rim of the target [2] to the middle of said target [2], with the parallel magnetic field being approximately zero at the center of said target [2] and rising towards said rim of said target.

With respect to claims 6 and 8-9, Larrinaga further discloses in fig. 1 the two magnet systems [3]-[5] comprising a first magnet system [4]-[5] being a combination of electromagnet and permanent magnet and placed behind the target [2]. It is expected that the combination of magnets has either a low field strength or a distance between said combination and the target results in a low field strength on the surface of said target. If not, it must be due to a claim limitation not currently present.

With respect to claim 7, Larrinaga further discloses in fig. 1 the first magnet system [4]-[5] comprising an electromagnet coil having inner dimensions that coincide with a deviation from a maximum of plus/minus 30% with a projection of the outer dimensions of the surface.

With respect to claim 10, Larrinaga further discloses in fig. 7 the first magnet system [4]-[5] and a second magnet system [3'] having opposite poles and arranged coaxially to said first magnet system [4]-[5].

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larrinaga (USPGPub 2004/0112736), equivalent to Goikoetxea et al (WO 02/077318), as applied to claim 10 above, and further in view of Ramalingam (US Patent No. 5,298,136).

With respect to claims 12-14, the reference is cited as discussed for claim 10. However Larrinaga is limited in that while the second magnet system comprising a second coil is present, it is not suggested to move said second magnet system in front of the target.

Ramalingam teaches an apparatus for controlled arc coating of substrates utilizing cathodes or targets (abstract), where fig. 1 depicts a vacuum arc deposition apparatus [10] with a target [20] with two magnet systems [19], [30] having opposite poles as depicted in fig. 3-7. Fig. 15 depicts a first magnet system [180] comprising an electromagnet coil behind the target [167], with a second magnet system [190] comprising an electromagnet coil in front of said target [167] and coaxial with said first magnet system [180]. Since fig. 15 depicts the electromagnet coil of the second magnet system [190] surrounding the electromagnet coil of the first magnet system [180], the diameter of said second magnet system [190] is larger than the first magnet system

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[180]. Ramalingam cites the advantages of the second magnet system as offsetting arc impedance changes and changing the arc impedance to change arc current without adjusting the arc power supply when constant voltage is provided (col. 11, lines 17-27).

It would have been obvious to one of ordinary skill in the art to place the second magnet system in front of the target as taught by Ramalingam for the second magnet system of Larrinaga to gain the advantages of offsetting arc impedance changes and changing the arc impedance to change arc current without adjusting the arc power supply when constant voltage is provided.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Larrinaga (USPGPub 2004/0112736), equivalent to Goikoetxea et al (WO 02/077318), as applied to claim 10 above, and further in view of Kadlec et al (US Patent No. 5,234,560).

With respect to claim 11, the reference is cited as discussed for claim 10. However Larrinaga is limited in that while a second magnet system is present, it is not suggested to place said second magnet system behind the first magnet system.

Kadlec et al teaches deposition onto a substrate from a target (abstract), where fig. 1A depicts a first magnet system [15] comprising an electromagnet coil behind a target [2] and a second magnet system [17] comprising an electromagnet coil behind said first magnet system [15]. Kadlec et al cites the advantage of the second magnet system being behind the first magnet system as giving the apparatus the ability to confine a dense plasma (col. 5, lines 62-68; col. 6, lines 1-34).

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8. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Larrinaga (USPGPub 2004/0112736), equivalent to Goikoetxea et al (WO 02/077318), as applied to claim 1 above, and further in view of Struempfel et al (US Patent No. 6,361,668).

With respect to claim 16, the reference is cited as discussed for claim 1. However Larrinaga is limited in that while the target is a cathode, it is not suggested that the target can be an anode.

Struempfel et al teaches in fig. 1 a target [12], and two magnet systems [7]-[8] behind said target [12], with a target voltage applied to said target [12] (col. 3, lines 28-30). Struempfel et al also teaches that at a particular time, the target [12] has a positive voltage applied and at a subsequent time, said target [12] has a negative applied (col. 1, lines 49-55), thus said target [12] is capable of being either a cathode or an anode is dependent upon time and user function. Struempfel et al cites the advantage of having the target capable of being either a cathode or anode as increasing utilization of the target (col. 1, lines 65-67).

It would have been obvious to one of ordinary skill in the art to have the target capable of being either a cathode or anode as taught by Struempfel et al for the target of Larrinaga to gain the advantage of increased utilization of the target. In addition, since the prior art of Struempfel et al recognizes the equivalency of a cathode and an anode in the field of target deposition, it would have been obvious to one of ordinary skill in the art to replace cathode target of Larrinaga with the cathode/anode target of Struempfel et al as it is merely the selection of functionally equivalent target depositions

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recognized in the art and one of ordinary skill would have a reasonable expectation of success in doing so. In addition, it would have been obvious to one of ordinary skill in the art to try the target as an anode or anode/cathode in an attempt to improve target utilization, as a person with ordinary skill has good reason to pursue the known options within his or her grasp since there exists only three options: a target cathode, a target anode, or a target cathode/anode.

Response to Arguments

Claim Objections

9. The Applicant has amended the claims to no longer contains multiple dependencies; the objections are withdrawn.

112 Rejections

10. The Applicant has amended the claims to particularly point out and distinctly claim the subject matter; the rejections are withdrawn.

102 Rejections

11. Applicant's arguments with respect to claims 1-16 and 33-34 have been considered but are moot in view of the new ground(s) of rejection due to the new limitation requiring the magnetic field perpendicular to the surface is zero over a greater part of the surface in addition to the limitations of newly examined claims 4-16 and 33-34.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Band whose telephone number is (571) 272-9815. The examiner can normally be reached on Mon-Fri, 9am-5pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. B./

Examiner, Art Unit 1795

/Jennifer K. Michener/

Supervisory Patent Examiner, Art Unit 1795